An Ordered Structure of Au_5Sn(Metallurgy)

to be about 18 erg/cm^2 from electron microscopic observation of extended dislocation nodes, and this value agrees well with an evaluation from calorimetric data.

An Ordered Structure of Au_5Sn

Kimio OSADA, Sadae YAMAGUCHI and Makoto HIRABAYASHI

Trans. Japan Inst. Met., **15** (1974), 256.

A new ordered structure of Au_5Sn is determined by X-ray and electron diffraction using single crystals. The unit cell of the hexagonal superstructure contains 15 Au and 3 Sn atoms, having the lattice constants $a=\sqrt{3}a_0$ and $c=3c_0$, where $a_0\sim2.94$ Å and $c_0\sim4.78$ Å are those of the fundamental *hcp* cell. The closest interatomic distance of Sn-Sn pairs is $\sqrt{3}\,a_0\sim5.1$Å, and the displacement of gold atoms from the ideal close packing is evaluated as 0.03_7Å. The ordered phase transforms to the disordered *hcp* phase (ζ) at 195°C, and a revised phase diagram of the region of 10–20 at%Sn is proposed.

Crystal Structure and Phase Transformation of the Vanadium-Oxygen System near $VO_{0.1}$

Kenji HIRAGA and Makoto HIRABAYASHI

Trans. Japan Inst. Met., **16** (1975), 431.

The crystal structure and phase transformation of the vanadium-oxygen alloys with O/V<0.28 were studied by combined methods of transmission electron microscopy, selected-area electron diffraction, X-ray powder diffraction and calorimetry. The interstitial oxygen atoms in the structure of $V_{12}O$-V_8O, which is usually termed as V_9O or α' phase, occupy regularly special octahedral sites in the *bct* metal subcell with the axial ratio $c/a\simeq0.96$. The superlattice of the metal subcell has the lattice parameters $A=B=4a$ and $C=6c$. The oxygen arrangement is characterized by the occurrence of periodic out-of-steps with the spacing $3c$ along the [001] direction. The ordered structure transforms at 519°C into the partially disordered β phase with the *bct* metal subcell of $c/a\simeq1.07$. A revised partial phase diagram is proposed.

Internal Friction Peaks of Cold Worked Dilute Copper Alloys

Kunihiko IWASAKI, Masahiro KOIWA and Ryukiti R. HASIGUTI

J. Phys. Soc. Japan, **39** (1975), 117.

The internal friction of cold worked dilute copper alloys (Cu-Ag and Cu-Au) is studied in the temperature range between −150°C and +140°C with an inverted torsion pendulum. The internal friction peaks which appear in cold worked pure copper are suppressed by the addition of solute atoms. In place of them two new peaks P_a and P_b are found at about −125°C and −60°C, respectively, in silver doped